

Digestibility of BMR Forage sorghum silage based diet compared to corn silage diet in beef feedlots steers from different background systems

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Introduction

- Texas High Plains is a semiarid region, with periods of long-standing drought and declining water supply for crop irrigation.
- Silage is a roughage source for dairy and feedlots operations in the Texas Panhandle, with a greater abundance of corn grown for silage compared to other sources.
- Corn has relatively high water requirements, resulting in growers more aggressively seeking alternative production options such as sorghum
- Sorghum provides an alternative for sustainable grain and forage production in the region due to reduced water requirements.
- Newer varieties of grain sorghum have been developed which are higher in nutrient digestibility, but adequate information is not currently available to properly assess nutritional properties of these varieties in beef and dairy diets.

Objective

- To evaluate apparent digestibility of nutrients of an improved BMR forage sorghum silage vs. corn silage-based diets for feedlot steers

Materials and Methods

- This project was conducted at the Texas Tech Brunnett center with a 2x2 factorial arrangement of treatments, with 2 backgrounding systems (calf-fed vs. yearling) and 2 silage sources in finishing diets (corn vs. forage sorghum).
- 128 steers were allotted into 32 pens, in which 64 steers originated from grazing background and 64 steers were in a calf-fed system.
- During the finishing phase, steers were fed either with the improved BMR forage sorghum silage or a leading corn silage hybrid.
- This study evaluated the digestibility of each of the diets by collecting samples of each diet and feed refusals daily and compositing by period. Fecal samples were collected twice a day for a period of 5 days.
- All the samples (diets and feces) were composited by experimental unit(pen), dried at 60°C for 72 hours and ground to pass a 1mm screen.
- Laboratorial analyses including dry matter, organic matter and acid insoluble ash (AIA) were conducted at Ruminant Nutrition Lab, at Texas Tech University.

- Formulas for digestibility calculation
 - $$\text{Feces} = \frac{DMI,kg \times AIA_{diet},\%}{AIA_{feces}}$$
 - $$\text{Digestibility},\% = \frac{DMI,kg - \text{Feces},kg}{DMI,kg}$$

Results

Table 1. Effects of type of silage and system on intake and apparent digestibility of nutrients on calf-fed and yearling feedlot steers.

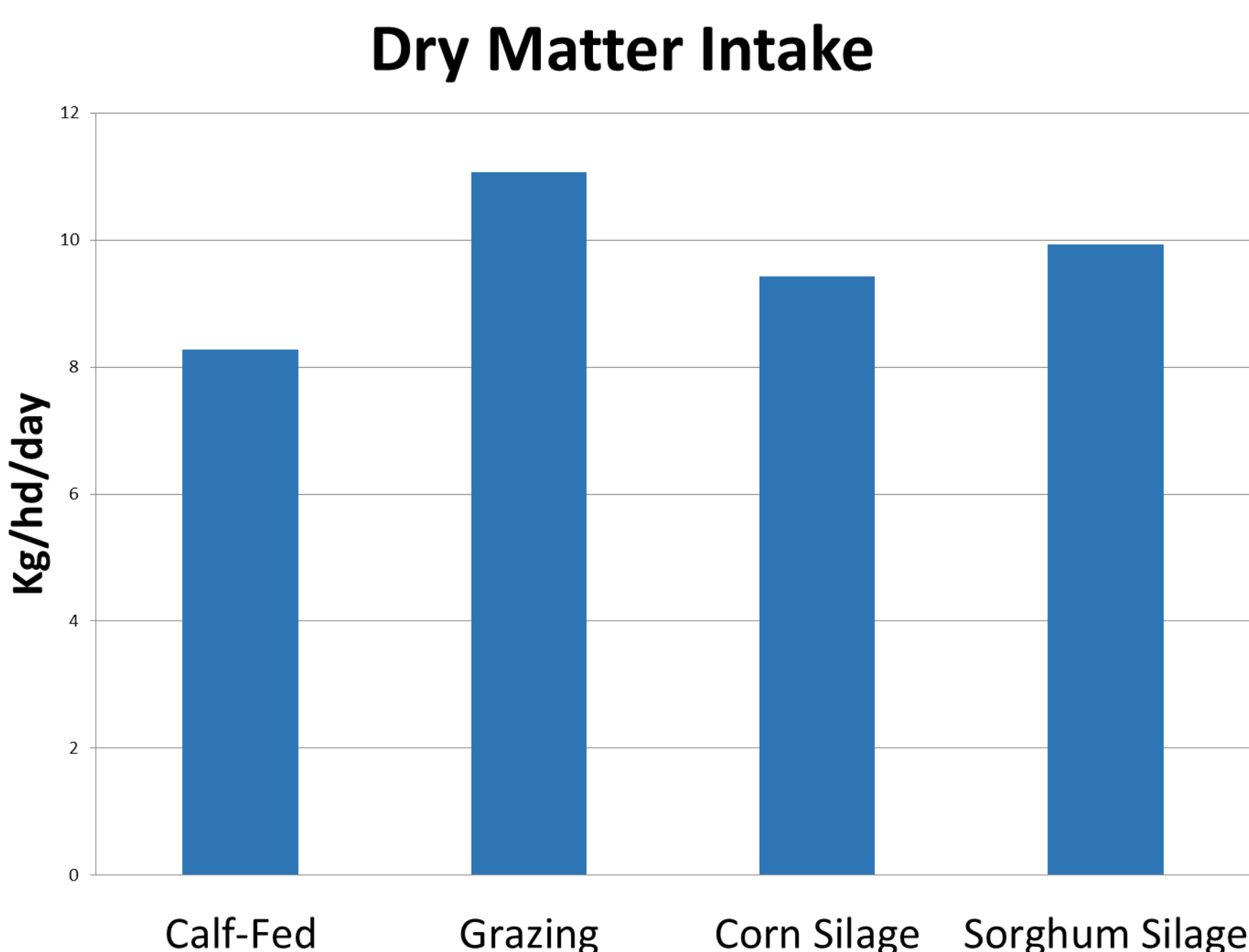
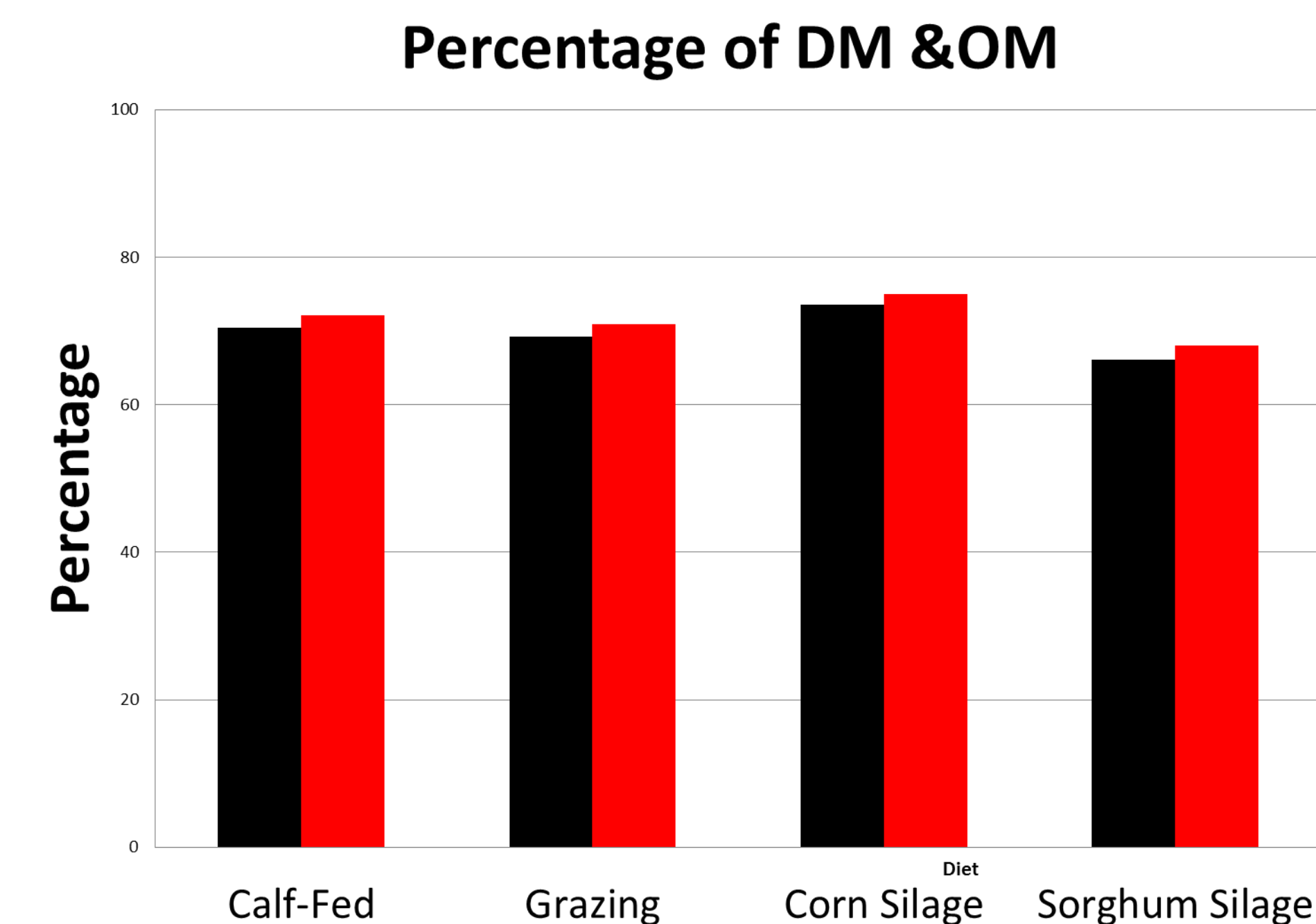
Item	System ¹			Diet ²			P - value		
	Calf-Fed	Yearling	SEM	Corn Silage	Sorghum Silage	SEM	System	Diet	System x Treatment
Intake, kg/hd/d									
DM	8.28	11.07	0.17	9.43	9.93	0.17	< 0.0001	0.03	0.15
Digestibility, %									
DM	70.46	69.19	0.89	73.54	66.10	0.89	0.22	< 0.0001	0.41
OM	72.18	70.96	0.87	75.07	68.08	0.87	0.23	< 0.0001	0.35

¹Calf-Fed= Steers that enter the feedyard directly after weanling.

Yearling= Steers that grazed forage sorghum for approximately 60 days prior to feedlot entry.

²Corn Silage= 20% (DM basis) dietary inclusion of Advanta forage sorghum silage.

Sorghum Silage= 20% (DM basis) dietary inclusion of a leading corn silage.



Results

- Yearling steers consumed more feed than calf-fed steers ($P < 0.01$)
- System did not affect digestibility of OM or DM ($P > 0.22$)
- Digestibility of OM and DM was greater for diets containing corn silage vs. sorghum silage ($P < 0.01$), potentially attributable to lower fiber digestibility of sorghum vs. corn.

Conclusion

- Corn silage diet appears to have a better apparent dry matter digestibility than the improved BMR forage sorghum silage.

